Future Plans for Microgravity Research in Fundamental Physics

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Last year, about 100 fundamental physics researchers met twice to develop plans for the future in this research area. The results of these meetings have been documented in a presentation package titled "A Roadmap for Fundamental Physics in Space". A summary of the Roadmap will be presented along with an overview of the current program. Research is being performed in Low Temperature and Condensed Matter Physics, Laser Cooling and Atomic Physics, and Gravitational and Relativistic Physics. There are currently over 50 investigators in the program of which 8 are being evaluated as potential flight experiments. The number of investigators is expected to grow further during the next selection cycle, planned to start toward the end of this year. Experimentation in Space has until now been limited to short duration flights aboard the Space Shuttle. In the near future, our investigators will be able to take advantage of long duration experimentation in Space using a suite of different carriers under development. Experiments needing Low Temperatures will be performed in a liquid helium facility being developed by JPL and Ball Aerospace. This apparatus will allow multiple investigations each flight and will attach to the ISS Japanese Experiment Module's Exposed Facility. Experiments in the Laser Cooling area are developing experiments for the EXPRESS racks inside the ISS US module. Experiments in Gravitational Physics can be performed in the low temperature facility, or can be independent free flyers to fully maximize the benefits inherent in the space environment. Research objectives in the High-Energy Physics area are being evaluated to determine if they can fit productively into the current umbrella of our research discipline.

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